

Appl. No. 10/069,409

Response dated April 29, 2005

Reply to Non-Final Office Action of February 15, 2005

REMARKS

The Examiner has rejected Claims 12-28 under 35 U.S.C. Section 103(a) as being unpatentable over Kilgore et al. (US Pat. No. 6,497,786) in view of Hurter et al. (U.S. Pat. No. 4,948,450). In view of the claim amendments made herein, Applicants believe that the aforementioned rejection has been rendered moot. However, in the interest of expediting examination of the present application Applicants wish to make the following remarks of record for the purpose of explaining why the claimed invention is patentable over the prior art cited in the rejection.

As reflected in amended Claim 12 (the only independent claim currently pending in the application), Applicants' invention is directed to a process for bonding substrates with hotmelt adhesive comprising:

- (a) providing at least two substrates for bonding together;
- (b) optionally, applying at least one primer to at least one of the substrates;
- (c) spraying at least one hotmelt adhesive in liquid form containing nanoscale particles having ferromagnetic, ferromagnetic, superparamagnetic or piezoelectric properties onto at least one of the substrates;
- (d) pressing the at least two substrates together so that the optional primer and the hotmelt adhesive are between the substrates and exposing at least the

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hotmelt adhesive to at least one alternating field selected from the group consisting of electrical, magnetic and electromagnetic alternating fields to heat the hotmelt adhesive; and
(e) cooling the hotmelt adhesive.

The Kilgore reference describes systems, methods and apparatus for bonding a plurality of substrates via a solventless, curable adhesive. A workpiece, according to the reference, may be assembled from a plurality of substrates with the curable adhesive disposed therebetween. Pressure is applied to the workpiece and the workpiece is irradiated with variable frequency microwave energy.

The Kilgore reference does suggest that the adhesive "may contain a microwave susceptible material (i.e., a dopant) which would serve to increase the susceptibility of adhesive to microwaves." [Column 11, lines 24-26] However, the reference fails to teach or suggest that the microwave susceptible material could be in the form of nanoscale particles (as required by Applicants' claimed process) or that any advantage could be obtained by using particles of this specific type.

The Kilgore reference is generally silent with respect to the particle size of the microwave susceptible materials suitable for use in the described adhesive bonding process. The reference does acknowledge "[t]he quantity of dopant required for optimum microwave heating efficiency depends

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on the physical properties of the dopant, such as the conductivity and the particle size and shape." [Column 11, lines 35-38] However, little additional specific guidance with respect to selecting the dopant particle size is provided. The only dopant materials whose particle sizes are mentioned are the carbon fibers described at Column 11, 49-56, which are clearly not nanoscale particles. Elsewhere in the reference it is noted that dopants in powder form (no particle size given) are ineffective (Column 12, lines 36-49).

Based on this disclosure, a worker of ordinary skill in the art would not have found it obvious to choose to use a hotmelt adhesive containing nanoscale particles having ferromagnetic, ferromagnetic, superparamagnetic or piezoelectric properties in a process for bonding substrates wherein the hotmelt adhesive is sprayed in liquid form onto at least one of the substrates.

The Hurter reference relied on by the Examiner does not cure the deficiencies of the Kilgore reference, as it provides no guidance or motivation to modify a bonding process using a hotmelt adhesive sprayed in liquid form onto a substrate by incorporating into the hotmelt adhesive nanoscale particles having ferromagnetic, ferromagnetic, superparamagnetic or piezoelectric properties. The Hurter reference is completely devoid of any discussion regarding the selection of suitable dopants for hotmelt adhesives to be used in a bonding process involving exposing the hotmelt

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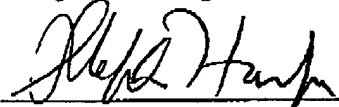
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adhesive to an alternating field selected from the group consisting of electrical, magnetic and electromagnetic alternating fields. Applicants' claimed process thus would not have been obvious to a worker of ordinary skill in the art from the disclosures of the Kilgore and Hurter references, either alone or in combination.

CONCLUSION

In view of the amendments and remarks above, Applicants ask for reconsideration and allowance of all pending claims. Should any fees be due for entry and consideration of this Amendment that have not been accounted for, the Commissioner is authorized to charge them to Deposit Account No. 01-1250.

Respectfully submitted,



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